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OCCUPATIONAL MATHEMATICS; CONVERSION OF FRACTIONS INTO DECIMALS. REPORT NO. 16-M. FINAL REPORT.

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This programed mathematics textbook is for student use in vocational education courses. It was developed as part of a programed series covering 21 mathematical competencies which were identified by university researchers through task analysis of several occupational clusters. The development of a sequential content structure was also based on these mathematics competencies. After completion of this program the student should be able to change simple fractions into decimals by writing them as equivalent fractions with their denominator a power of 10 and fractions into decimals by dividing the numerator by the denominator. The material is to be used by individual students under teacher supervision. Twenty-six other programed texts and an introductory volume are available as VT 006 882-VT 006 909, and VT 006 975. (EM)

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FINAL REPORT
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Contract No. OEG-4-7-070031-1626
Report No. 16-M

Occupational Mathematics

CONVERSION OF FRACTIONS INTO DECIMALS

June 1968

U.S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE

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Occupational Mathematics

CONVERSION OF FRACTIONS INTO DECIMALS

REPORT NO. 16-M.

Project No. 0E7-0031
Contract No. OEG-4-7-070031-1626
Report No. 16-M

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June 1968

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Washington State University, Department of Education, Pullman, Washington
State Coordinating Council for Occupational Education, Olympia, Washington

OBJECTIVES

1. The student should be able to change simple fractions into decimals by writing them as equivalent fractions with their denominator a power of ten.

2. The student should be able to change fractions into decimals by dividing the numerator by the denominator.

Greetings! You are about to begin improving your knowledge of basic mathematics. There are many important uses for the mathematics you are learning.

This booklet is not like your ordinary books. It is designed to help you learn as an individual. On the following pages you will find some information about mathematics. After the information is presented, you will be asked a question. Your answers to these questions will determine how you proceed through this booklet. When you have selected your answer to the question, turn to the page you are told to.

Do not write in this booklet. You may wish to have a pencil and some paper handy so you can write when you want to.

Remember this is not an ordinary book.

1. Study the material on the page.
2. Read the question on the page (you may want to restudy the material on the page).
3. Select the answer you believe is correct.
4. Turn to the page indicated by your answer.

Are you ready to begin?

(a) Yes — Turn to page 1

(b) No — Turn to page C

(c) HELP — Go see your teacher

Your answer was (b) No.

Well, this booklet is a little different.

Go back and read page B again. After you have read it, you will probably be ready to begin.

You are probably aware that fractional parts of whole numbers are often expressed in two ways: (1) fractions and (2) decimals. It is often necessary to be able to change a fraction to its <u>equivalent</u> decimal form. This Unit will help you learn to do this.

See if you can work this problem:

What is the decimal value of 1/10?

(a) .01 Turn to page 9

(b) .1 Turn to page 7

(c) I don't know what to do Turn to page 6

No. Look at this way.

One easy way to convert fractions with 10, 100, 1,000 or 1 and any number of zeroes is simply to count the zeroes. Then you move the decimal point one position to the left for each zero.

Thus, 14/100 = .14 14/1000 = .014

236/1000 = .236 236/10000 = .0236

Here's another for you.

Convert 29/100 to a decimal.

(a) .029 Turn to page 4

(b) 2.9 Turn to page 12

(c) .29 Turn to page 8

Right: You located the numerator correctly in the tenths' position.

How do you write 7/10 as a decimal?

(a)	.07	Turn to page 13
(b)	7	Turn to page 14
(c)	.7	Turn to page 7

Ooops! You slipped up.

When expressing any fraction in hundredths, you must have two decimal places. Your answer did not have two.

See if you can do better this time.

What is the decimal equivalent of 97/100?

(a) 9.7 Turn to page 5

(b) .97 Turn to page 8

(c) .0097 Turn to page 15

Incorrect.

You really should be able to work this type of problem.

Go work Unit 8 before continuing this Unit.

You really need to know how to change fractions with 10, 100, or 1000 into decimals before you proceed.

Before continuing with this Unit, you need to work Unit 8. It will teach you to do this.

Correct! Very good.

Here is your next problem.

14/100 written in decimal form is:

(a)	1.4	Turn to page 10
(b)	.14	Turn to page 31
(c)	.014	Turn to page 2

Fine! Your last answer was correct.

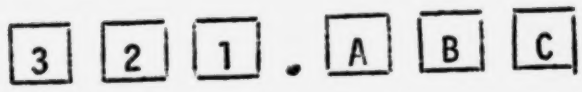
What is 36/100 written as a decimal?

(a) .36 Turn to page 31

(b) .036 Turn to page 4

(c) 3.6 Turn to page 16

No. You should recall that in a decimal number the tenths place is the first position to the right of the decimal point.



In our model, the tenths are located in the block marked [A]. The numerator of 1/10 tells us we have one tenth, so 1/10 would be written as ".1".

How would you write 4/10 as a decimal?

(a) .4 — Turn to page 3

(b) .04 — Turn to page 13

(c) 4 — Turn to page 11

Hold on here!

You said 14/100 is the same as 1.4. You only moved the decimal point one place. You should have moved it two places. Notice that your answer doesn't really make much sense. Something greater than one cannot equal something less than one.

Now go back to page 7 and work the problem again.

What? How can 4/10 = 4? It can't. 4/10 is less than one.

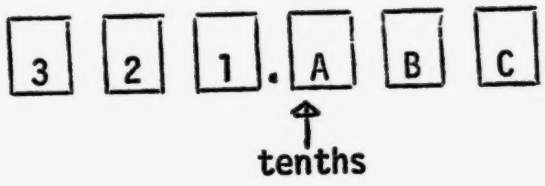
Were you just careless?

Go back to page 9 and make another selection.

Be careful! You said that 29/100 = 2.9.

Better go back to page 2 and try again.

Hold on now. You said that the number of tenths should be expressed in the second place to the right of the decimal point. Wrong! Tenths are found in the first place to the right of the decimal point.



Remember this model. It should help you.

How would you write 9/10 as a decimal?

(a) .9 Turn to page 3

(b) .09 Turn to page 15

(c) .009 Turn to page 5

Hold it! 7/10 is a quantity less than one. Right?
O.K., then it is not possible for 7/10 to equal 7.

You'd better go back to page 3 and think a little
more this time.

Incorrect. You really should be able to work this type of problem.

Go work Unit 8 before continuing this Unit.

Ooops. You slipped up.

When expressing any fraction in hundredths, you must have two decimal places. Your answer did not have two.

See if you can do better this time.

What is the decimal equivalent of 97/100?

(a)	9.7	Turn to page 5
(b)	.97	Turn to page 8
(c)	.0097	Turn to page 15

No. You still don't get it.

There is an easy to convert a fraction with 10, 100, or 1000 for its denominator to a decimal. You simply take the numerator and move the decimal one place to the left for each zero.

For example, 5/100 would be .05 (moved 2 places). 39/1000 would be .039.

What is the decimal equivalent of 8/100?

(a)	.8	Turn to page 22
(b)	.008	Turn to page 25
(c)	.08	Turn to page 29

Fine!

Try this one.

The fraction 9/1000 can be expressed in decimal form as:

(a)	.009	Turn to page 42
(b)	.09	Turn to page 26
(c)	.9	Turn to page 24

No. You still don't get it.

There is an easy way to convert a fraction with 10, 100, or 1000 for its denominator to a decimal. You simply take the numerator and move the decimal one place to the left for each zero.

For example, 5/100 would be .05 (moved 2 places). 39/1000 would be .039.

What is the decimal equivalent of 8/100?

(a)	.8	Turn to page 22
(b)	.008	Turn to page 25
(c)	.08	Turn to page 29

Correct!

Try this one.

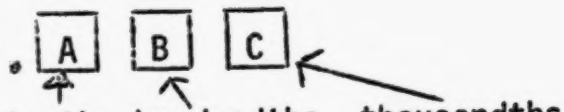
What is the decimal equivalent of 57/1000?

(a) .057 Turn to page 42

(b) .0057 Turn to page 32

(c) .57 Turn to page 23

No. .18 is the same as 18/100.

Remember 

Now go back and rework the problem on page 24.

Come on now. It really isn't that bad.

Go to page 31 and try a little harder this time.

Ooops! Did you forget that thousandths have <u>three</u> decimal places?

What is 39/1000 expressed as a decimal?

(a)	.039	Turn to page 20
(b)	.39	Turn to page 17
(c)	.0039	Turn to page 19

No. When you want thousandths, there must be <u>three</u> decimal places. In A B C, the C is in the thousandths place. So 9/1000 should be .009.

What is the decimal equivalent of 18/1000?

(a) .0018 Turn to page 23

(b) .018 Turn to page 20

(c) .18 Turn to page 21

Come on now. It really isn't that hard.

Go to page 31 and try a little harder this time.

No.

When you want thousandths, there must be <u>three</u> decimal places. In .[A][B][C], the [C] is in the thousandths' place. So 9/1000 should be .009.

What is the decimal equivalent of 18/1000?

(a)	.0018	Turn to page 23
(b)	.018	Turn to page 20
(c)	.18	Turn to page 21

No.

Let's take a look at the model again. Which is the hundredths position? [3] [2] [1] . [A] [B] [C]
The [B] represents hundredths. So, since we had 2/100, you should have written .02.

Now, how do you express 5/100 as a decimal?

(a) .05 Turn to page 29

(b) .5 Turn to page 17

(c) .005 Turn to page 19

Come now. How can 6/100 = 6? You know better than that.

Go back to page 29 and make a better selection.

Correct!

How would you write 6/100 as a decimal?

(a) 6 Turn to page 28

(b) .06 Turn to page 18

(c) .006 Turn to page 17

No.

Let's take a look at the model again. Which is the hundredths position? [3] [2] [1] . [A] [B] [C]
The [B] represents hundredths. So, since we had 2/100, you should have written .02.

Now, how do you express 5/100 as a decimal?

(a) .05 Turn to page 29

(b) .5 Turn to page 17

(c) .005 Turn to page 19

You are doing fine!

Try this one.

How would you express 2/100 as a decimal?

(a)	.2	Turn to page 30
(b)	.002	Turn to page 27
(c)	.02	Turn to page 18

Ooops. Did you forget that thousandths have <u>three</u> decimal places?

What is 39/1000 expressed as a decimal?

(a)	.039	Turn to page 20
(b)	.39	Turn to page 17
(c)	.0039	Turn to page 19

No. You seem to be forgetting the rule. That is, just move the decimal point one place to the left for every zero in the denominator.

Express 149/10 as a decimal number.

(a) 14.9 Turn to page 46

(b) 1.49 Turn to page 39

Fine!

See if you can work this one.

How would you express 31975/1000 as an equivalent decimal number?

(a) 31.975 Turn to page 49

(b) 3.1975 Turn to page 35

(c) 319.75 Turn to page 38

No.

You located the decimal point incorrectly.

Remember, for thousandths you should count off three decimal places.

What is 9817/1000 expressed as an equivalent decimal number?

(a) 98.17 Turn to page 45

(b) 981.7 Turn to page 33

(c) 9.817 Turn to page 46

You said that 419/100 = 419. That doesn't make much sense, does it?

You're just not trying very hard.

Go back to page 43 and make a more logical selection.

No. Your answer was incorrect.

The problem was 23/10. Since there is one zero in the denominator, you can simply move the decimal point one place to the left in the numerator. 23/10 then becomes 2.3.

How would you express 78/10 as a decimal number?

(a) 780/100 Turn to page 40

(b) .78 Turn to page 39

(c) 7.8 Turn to page 43

No. You located the decimal point incorrectly.

Remember, for thousandths you should count off three decimal places.

What is 9817/1000 expressed as an equivalent decimal number?

(a) 98.17 Turn to page 45

(b) 981.7 Turn to page 33

(c) 9.817 Turn to page 46

No. You just aren't getting it. Let's look at a few examples.

78/10 = 7.8 358/100 = 3.58 476/10 = 47.6

1937/1000 = 1.937 123/10 = 12.3 984/100 = 9.84

See how the zeroes work? In changing to decimal numbers, you move the decimal point in the numerator one place to the left for each zero.

So, then how would you express 53/10 as a decimal number?

(a) 5.3 Turn to page 43

(b) .53 Turn to page 44

Hold on! Don't be in such a hurry.

The answer you chose is not even a decimal number.

Go back to page 37 and see if you can make a reasonable choice.

No. Your answer was incorrect.

The problem was 23/10. Since there is one zero in the denominator, you can simply move the decimal point one place to the left in the numerator. 23/10 then becomes 2.3.

How would you express 78/10 as a decimal number?

(a) 780/100 Turn to page 40

(b) .78 Turn to page 39

(c) 7.8 Turn to page 43

Excellent! Keep up the good work.

Express 23/10 as a decimal number.

(a)	.23	Turn to page 37
(b)	2.3	Turn to page 34
(c)	.023	Turn to page 41

Correct.

Try this one.

Change 419/100 to its decimal equivalent.

(a)	419	Turn to page 36
(b)	4.19	Turn to page 34
(c)	41.9	Turn to page 39

Incorrect.

You are making this much too difficult. Ask your teacher for additional help.

Then return to the beginning of this Unit.

No. You seem to be forgetting the rule. That is, just move the decimal point one place to the left for every zero in the denominator.

Express 149/10 as a decimal number.

(a) 14.9 Turn to page 46

(b) 1.49 Turn to page 39

Fine!

Now try this one.

How would you express 356/100 in decimal form?

(a)	3.56	Turn to page 49
(b)	35.6	Turn to page 45
(c)	.356	Turn to page 33

Incorrect.

The problem was to change 2/5 to a decimal. Let's look at a clever way to do it. Notice that 2/5 x 2/2 = 4/10. If you can change the fraction into an equivalent fraction with 10 or 100 in the denominator, the problem becomes very easy. It would then be just like the problem you have been doing so far.

In the last problem 2/5 = 2/5 x 2/2 = 4/10. You know that 4/10 = .4. This is a method that should help you save time.

Now try this problem.

What is the decimal equivalent of 7/20?

(a)	.7	Turn to page 55
(b)	.35	Turn to page 53
(c)	.2	Turn to page 52

Very good!

See if you can do this one by the same method.

21/50 is equal to what decimal number?

(a) .21 Turn to page 60

(b) .42 Turn to page 67

(c) .44 Turn to page 51

Very good!

Let's try a few different types.

Express 2/5 as a decimal.

(a) .04 Turn to page 47

(b) .2 Turn to page 54

(c) .4 Turn to page 48

Correct! Keep it up.

11/20 is equal to which of the following?

(a) .11 Turn to page 59

(b) .21 Turn to page 61

(c) .55 Turn to page 67

Ooops! I think maybe you were a little careless there. You should have said 21/50 = 21/50 x 2/2 = 42/100 = .42.

Try another one.

Convert 40/50 to a decimal number.

(a) 1.25 Turn to page 58

(b) .45 Turn to page 59

(c) .8 Turn to page 50

No. You still don't see it. Let's look at some examples.

9/20 = 9/20 x 5/5 = 45/100 = .45

12/50 = 12/50 x 2/2 = 24/100 = .24

4/5 = 4/5 x 2/2 = 8/10 = .8

Notice that in each case the original fraction was changed to an equivalent fraction with 10 or 100 as the denominator. Once that is done, you simply put as many decimal places in your answer as there are zeroes in the denominator.

Using the method that was just explained, see if you can work this one.

How would you express 3/5 in decimal form?

(a) .6 Turn to page 53

(b) .35 Turn to page 57

Right! Now you have the idea.

Try this one.

Convert 8/25 into a decimal.

(a) .8 Turn to page 52

(b) .16 Turn to page 56

(c) .32 Turn to page 48

Incorrect.

The problem was to change 2/5 to a decimal. Let's look at a clever way to do it. Notice that 2/5 x 2/2 = 4/10. If you can change the fraction into an equivalent fraction with 10 or 100 in the denominator, the problem becomes very easy. It would then be just like the problems you have been doing so far.

In the last problem 2/5 = 2/5 x 2/2 = 4/10. You know that 4/10 = .4. This is a method that should help you save time.

Now try this problem.

What is the decimal equivalent of 7/20?

(a) .7 Turn to page 55

(b) .35 Turn to page 53

(c) .2 Turn to page 52

No. You still don't see it. Let's look at some examples:

9/20 = 9/20 x 5/5 = 45/100 = .45

12/50 = 12/50 x 2/2 = 24/100 = .24

4/5 = 4/5 x 2/2 = 8/10 = .8

Notice that in each case the original fraction was changed to an equivalent fraction with 10 or 100 as the denominator. Once that is done, you simply put as many decimal places in your answer as there are zeroes in the denominator.

Using the method that was just explained, see if you can work this one.

How would you express 3/5 in decimal form?

(a) .6 Turn to page 53

(b) .35 Turn to page 57

Ooops! .8 is equal to 8/10. Our problem was 8/25.

Go back to page 53 and see if you can make a better selection.

Incorrect.

Let's look at the problem solved correctly.

$3/5 = 3/5 \times 2/2 = 6/10 = .6$

See how easy it is. I don't think you're trying hard enough.

Go to page 49 and continue from there.

Hold on! It looks to me like you inverted the problem. The problem was 40/50, not 50/40.

Better go back and work the problem on page 60 again.

No. You didn't get it.

Here's one a little easier.

What is the decimal equivalent of 1/5?

(a) .5 Turn to page 52

(b) .2 Turn to page 50

Ooops! I think maybe you were a little careless there.

You should have said 21/50 = 21/50 x 2/2 = 42/100 = .42

Try another one.

Convert 40/50 to a decimal number.

(a) 1.25 Turn to page 58

(b) .45 Turn to page 59

(c) .8 Turn to page 50

ilo. You didn't get it.

Here's one a little easier.

What is the decimal equivalent of 1/5?

(a) .5 Turn to page 52

(b) .2 Turn to page 50

You are having trouble, aren't you? You need some extra help on division.

Go work Unit 11 on division of fractions. Then return to page 67 of this Unit.

What? Do you know what you did? You divided the numerator into the denominator. That is backward.

Go back to page 69 and see if you can do it correctly this time.

No. Did you divide incorrectly?

You should have divided 3 by 8. That is the general way to convert any fraction to a decimal. That is, divide the numerator by the denominator.

Now try this one.

Find the decimal value of 9/16.

(a) 5.63 Turn to page 77

(b) .563 Turn to page 75

(c) 1.778 Turn to page 74

Fine! You are doing well.

What is the decimal equivalent of 5/7?

(a) .714 Turn to page 92

(b) 7.14 Turn to page 68

(c) .071 Turn to page 76

You are having trouble, aren't you? You need some extra help on division.

Go work Unit 11 on division of fractions. Then return to page 67 of this Unit.

O.K!

Now let's proceed with some problems that are a little different from the last ones. All answers should be rounded to three decimal places.

Express 3/8 as a decimal number.

(a) 2.667 Turn to page 64

(b) .375 Turn to page 65

(c) I don't know how to do it Turn to page 72

Ooops! You performed the division correctly, but you mislocated the decimal.

See if you can do better on this one.

Convert 5/12 to a decimal number.

(a) .042 Turn to page 73

(b) .417 Turn to page 78

(c) 41.667 Turn to page 71

No. You were careless on that one. Take your time when you are performing the division.

Try this one.

How would you express 5/9 as a decimal number?

(a) 1.8 Turn to page 63

(b) .59 Turn to page 74

(c) .556 Turn to page 75

Hold on there! You found the value for 15/11, but that wasn't what you were asked to do.

Better go back to page 75 and try again.

You're just not trying very hard. How can 5/12 = 41.667? If 12/12 = 1, then certainly 5/12 is less than one!

Go back to page 68 and make a more reasonable selection.

One way you can <u>always</u> use to change a fraction to a decimal is simply to <u>divide</u> the <u>numerator</u> of the fraction by the <u>denominator</u>.

For example, in 3/8, $\frac{3}{8}$ -> Numerator
-> Denominator.

So, $8\overline{)3.000}$ <- Quotient $.375$

The quotient will be the correct decimal equivalent for the fraction. All right?

Are you ready to try one more?

Find the decimal value of 9/16.

(a) 5.63 Turn to page 77

(b) .563 Turn to page 75

(c) 1.778 Turn to page 74

No. You must locate the decimal point correctly.

Look at this example:

$$\begin{array}{r} .5 \\ 10\,\overline{)\,5.000} \\ \underline{50} \\ -- \end{array}$$

Notice that both decimal points are in a vertical line.

See if you can do it correctly this time.

Convert 2/3 to a decimal number.

(a) 6.667 Turn to page 66

(b) .667 Turn to page 78

Doggone it! It's just not that hard.

There are only two things you need to do. First, divide the numerator <u>by</u> (not into) the denominator. Second, correctly locate the decimal point.

Here is an example:

3/8 = 3 ÷ 8 We have

$$\begin{array}{r} .375 \\ 8\overline{)3.000} \\ 24 \\ \hline 60 \\ 56 \\ \hline 40 \\ 40 \\ \hline \end{array}$$

Notice how the decimal points are lined up. Also, notice that you can put as many zeroes as you need after the 3. in the dividend.

Now try this problem.

What is the decimal equivalent of 1/8?

(a) .125 Turn to page 75

(b) .0125 Turn to page 62

(c) 1.25 Turn to page 66

Correct!

Here's another.

How would you express 11/15 as a decimal number?

(a) .854 Turn to page 69

(b) .733 Turn to page 65

(c) 1.364 Turn to page 70

Ooops! You performed the division correctly, but you mislocated the decimal.

See if you can do better on this one.

Convert 5/12 to a decimal number.

(a) .042 Turn to page 73

(b) .417 Turn to page 78

(c) 41.667 Turn to page 71

You worked all the numbers correctly, but you made a decimal error.

Go to page 64 and see if you can find a better answer.

Correct!

Here's another one.

What decimal number is equal to the fraction 7/9?

(a) .778 Turn to page 92

(b) 7.778 Turn to page 79

(c) .078 Turn to page 73

No. You must locate the decimal point correctly.

Look at this example:

```
      .5
10 /5.000      Notice that both decimal points
   5 0
   --          are in a vertical line.
```

See if you can do it correctly this time.

Convert 2/3 to a decimal number.

(a) 6.667 Turn to page 66

(b) .667 Turn to page 78

No. You must have divided too quickly.

12/15 = .8. It divides evenly.

Now, see if you can express 3/14 as a decimal number.

(a) 3.14 Turn to page 89

(b) .214 Turn to page 82

Come now.

You can tell by inspection that 18/25 is not equal to 7.2. 18/25 is less than one!

Go back to page 84 and make a more reasonable selection.

Excellent! You are correct.

Convert 12/15 to a decimal number.

(a)	.87	Turn to page 80
(b)	1.25	Turn to page 89
(c)	.8	Turn to page 103

No. You located the decimal point incorrectly.

The correct answer was that 4/11 is equal to .364.

What is the decimal equivalent of 3/17?

(a)	.176	Turn to page 82
(b)	1.765	Turn to page 89
(c)	3.17	Turn to page 94

Correct!

What is the decimal equivalent of 18/25?

(a) .72 Turn to page 86

(b) 7.2 Turn to page 81

(c) .75 Turn to page 88

No. You located the decimal point incorrectly.

The correct answer was that 4/11 is equal to .364.

What is the decimal equivalent of 3/17?

(a)	.176	Turn to page 82
(b)	1.765	Turn to page 89
(c)	3.17	Turn to page 94

Fine! Your last answer was correct.

See if you can do this one.

The decimal equivalent of 4/11 is:

(a)	.036	Turn to page 83
(b)	3.636	Turn to page 85
(c)	.364	Turn to page 103

No. You are making this too difficult. There are two methods we have learned. They are:

1. If the fraction can be changed to an equivalent fraction with 10 or 100 as a denominator, do it. Then simply locate the decimal point in the numerator, allowing one decimal place for each zero in the denominator.

2. The method which will <u>always</u> work is to divide the numerator <u>by</u> the denominator.

Keeping these methods in mind, go back to page 92 and do the problem more carefully this time.

Ooops! You slipped up on locating the decimal point.

Be more careful on this one.

What decimal number is equal to 9/25?

(a) .9 Turn to page 87

(b) .036 Turn to page 90

(c) .36 Turn to page 84

No. You had the correct numbers, but you mislocated the decimal point.

See if you can do better on this one.

What is the decimal equivalent of 5/5?

(a) .083 Turn to page 87

(b) .833 Turn to page 82

(c) 8.333 Turn to page 90

No. You are making this too difficult. There are two methods we have learned. They are:

1. If the fraction can be changed to an equivalent fraction with 10 or 100 as a denominator, do it. Then simply locate the decimal point in the numerator, allowing one decimal place for each zero in the denominator.

2. The method which will <u>always</u> work is to divide the numerator <u>by</u> the denominator.

Keeping these methods in mind, go back to page 92 and do the problem more carefully this time.

No. You made a mistake in placing the decimal point.

Did you remember the first method you learned for working this type of problem? Remember, 17/20 = 17/20 x 5/5 = 85/100 = .85. That is the simplest way to work it.

O.K. Now try this one.

Convert 11/20 to a decimal number.

(a) 1.82 Turn to page 93

(b) .55 Turn to page 84

(c) .055 Turn to page 88

Very good!

Now, what is the decimal equivalent of 17/20?

(a) .85 Turn to page 86

(b) .085 Turn to page 95

(c) 8.5 Turn to page 91

Hold on there. You performed your division backward.

Turn back to page 95 and try again.

No. 3.17 is not correct. The problem was 3/17, not 3.17.

You aren't being very careful. Go back to page 85 and see if you can make a better selection.

No. You made a mistake in placing the decimal point.

Did you remember the first method you learned for working this type of problem? Remember, 17/20 = 17/20 x 5/5 = 85/100 = .85. That is the simplest way to work it.

O.K. Now try this one.

Convert 11/20 to a decimal number.

(a) 1.82 Turn to page 93

(b) .55 Turn to page 84

(c) .055 Turn to page 88

No. You seem to be having difficulty with the fractions where the numerator is larger than the denominator.

Look at this example: $7/3 = 3\overline{)7.000}$ (2.333) So 7/3 = 2.333.

$$\begin{array}{r} 2.333 \\ 3\overline{)7.000} \\ \underline{6} \\ 10 \\ \underline{9} \\ 10 \\ \underline{9} \\ 10 \end{array}$$

Be careful to line the decimal points up properly.

Then just perform the division.

Now go to page 103 and work from there.

No.

The correct answer was 1.75. You should have divided 7 by 4 and then correctly located the decimal point.

Convert 8/5 to its equivalent decimal number.

(a)	1.6	Turn to page 101
(b)	.16	Turn to page 104
(c)	.625	Turn to page 112

No.

The correct answer was 1.75. You should have divided 7 by 4 and then correctly located the decimal point.

Convert 8/5 to its equivalent decimal number.

(a)	1.6	Turn to page 101
(b)	.16	Turn to page 104
(c)	.625	Turn to page 112

No. You are incorrect. Let's look at the solution.

```
                8.444
380/45 = 45 /380.000
           360
            20 0
            18 0
             2 00
             1 80
               200
               180
                20
```

There is really nothing difficult about this problem.

See if you can do better on this one.

What is the decimal equivalent of 210/55?

(a) 3.818 Turn to page 111

(b) 261 Turn to page 109

(c) 382 Turn to page 105

Excellent! You have now completed this Unit. Let's review what you've learned.

1. When a fraction has 10 or 100 for its denominator, you change it to a decimal by simply putting as many decimal places in the numerator as there are zeroes in the denominator.

2. If you can change a fraction to an equivalent fraction with 10 or 100 as a denominator, do it and proceed as in #1 above.

3. For all fractions you can divide the numerator by the denominator in order to change it to decimal form. This is one method which <u>always</u> works, regardless of the numbers involved.

Tell your teacher you have finished this Unit and are ready for a test.

Quite right!

Keep it up.

How would you express 39/12 as a decimal number?

(a) 3.25 Turn to page 108

(b) .325 Turn to page 113

(c) .307 Turn to page 104

No. You seem to be having difficulty with the fractions where the numerator is larger than the denominator. Look at this example:

$$7/3 = 3\overline{)7.000} \quad 2.333$$

$$\begin{array}{r} 6 \\ \hline 10 \\ 9 \\ \hline 10 \\ 9 \\ \hline 10 \end{array}$$

So, 7/3 = 2.333.

Be careful to line the decimal points up properly. Then just perform the division.

Now go to page 103 and work from there.

Fine!

Keep up the good work.

Convert 7/4 to a decimal number.

(a)	.571	Turn to page 97
(b)	.175	Turn to page 98
(c)	1.75	Turn to page 108

No. I think you're just working too fast. Come on, now. If you can get a few more right, you'll be done.

Now, what is the decimal equivalent of 5/3?

(a)	.6	Turn to page 96
(b)	1.667	Turn to page 101
(c)	1.6	Turn to page 102

Incorrect.

Come now. You've come this far. I know you can do better. Work carefully on this one.

What is the decimal equivalent of 44/12?

(a) 3.667 Turn to page 111

(b) .367 Turn to page 104

(c) .272 Turn to page 113

No. You are incorrect.

Let's look at the solution: $380/45 = 45\overline{)380.000}$ = 8.444

360
20 0
18 0
2 00
1 80
200
180
20

There is really nothing difficult about this problem.

See if you can do better on this one.

What is the decimal equivalent of 210/55?

(a) 3.818 Turn to page 111

(b) .261 Turn to page 109

(c) .382 Turn to page 105

Your answer of .543 is not correct. Although you divided correctly, you made an error in locating the decimal point.

Be more careful on this one.

Convert 91/15 to a decimal number.

(a) .607 Turn to page 105

(b) 6.067 Turn to page 111

(c) .165 Turn to page 110

Very fine!

Here's another one. Don't let the larger numbers fool you. Do exactly the same as you've been doing.

Convert 350/45 to a decimal number.

(a)	8.444	Turn to page 100
(b)	.844	Turn to page 99
(c)	.118	Turn to page 106

Ooops! Be careful. You divided that one backward.

Go back to page 99 and do it correctly this time.

Incorrect.

Come now. You've come this far. I know you can do better.

Work carefully on this one.

What is the decimal equivalent of 44/12?

(a)	3.667	Turn to page 111
(b)	.367	Turn to page 104
(c)	.272	Turn to page 113

Exactly right!

Now, what decimal number is the same as 413/76?

(a) .183 Turn to page 105

(b) .543 Turn to page 107

(c) 5.434 Turn to page 100

Incorrect.

Remember, you should divide the numerator <u>by</u> the denominator.

Go back to page 98 and try again.

No.

I think you're just working too fast. Come on, now.

If you can get a few more right, you'll be done.

Now, what is the decimal equivalent of 5/3?

(a)	.6	Turn to page 96
(b)	1.667	Turn to page 101
(c)	1.6	Turn to page 102

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CAI MATHEMATICS

TEST QUESTIONS

UNIT 12 - CONVERSION OF FRACTIONS INTO DECIMALS

Directions: If rounding off is necessary, round off to 2 decimal places.

1. What is the decimal value of 1/100?

   a) .01

   b) 100.0

   c) .1

2. Express 3/8 as a decimal

   a) .380

   b) .375

   c) .4

3. Convert 417/10 to a decimal

   a) .417

   b) 4.17

   c) 41.7

4. What is the decimal value of 27/12?

   a) 22.5

   b) 2.25

   c) .225

5. 32/1000 can be written as

   a) 3.02

   b) .032

   c) 0.32

6. Find the decimal value of 9/16

   a) .56

   b) 5.6

   c) .57

7. What is the decimal value of 13/10000?

   a) .0013

   b) .00013

   c) .013

8. Convert 5/12 to a decimal

   a) .43

   b) .424

   c) .42

9. 2475/100 =

   a) 247.5

   b) 24.75

   c) 2.475

10. Convert 150/12 to a decimal

   a) .125

   b) 12.5

   c) 1.25

11. The fraction 1/1000 is equal to

   a) .1

   b) .01

   c) .001

6. Find the decimal value of 9/16

   a) .56

   b) 5.6

   c) .57

7. What is the decimal value of 13/10000?

   a) .0013

   b) .00013

   c) .013

8. Convert 5/12 to a decimal

   a) .43

   b) .424

   c) .42

9. 2475/100 =

   a) 247.5

   b) 24.75

   c) 2.475

10. Convert 150/12 to a decimal

   a) .125

   b) 12.5

   c) 1.25

11. The fraction 1/1000 is equal to

   a) .1

   b) .01

   c) .001

12. The fraction 5/9 is equal to

    a) .56

    b) 5.56

    c) .544

13. 12/10 has a decimal equivalent of

    a) 1.2

    b) .12

    c) 120

14. The fraction 13/20 can be written as

    a) 6.5

    b) 0.65

    c) .065

15. What is 18/1000 expressed as a decimal?

    a) .18

    b) .0018

    c) neither

16. Convert 38/15 to a decimal

    a) 2.53

    b) .026

    c) 25.3

17. You can also write 4/100 as

    a) .4

    b) .04

    c) .004

18. 18/25 is equal to

    a) 7.2

    b) .072

    c) .72

19. 136/1000 is equivalent to

    a) .136

    b) 13.6

    c) .0136

20. The fraction 93/50 is equal to

    a) 1.76

    b) 1.86

    c) 1.96

21. 5983/100 can be written as

    a) 598.3

    b) .5983

    c) 59.83

22. You can express 2/3 as

    a) .67

    b) .65

    c) 6.67

23. 1000/10 is equal to

    a) 100,000

    b) 100

    c) 10

24. 15/40. to three decimal places, is

    a) .375

    b) 3.750

    c) .357

25. Change 829/100 to its decimal equivalent.

    a) .829

    b) 8.29

    c) 82.9

ANSWER SHEET

UNIT 12 - CONVERSION OF FRACTIONS INTO DECIMALS

1. a
2. b
3. c
4. b
5. b
6. a
7. a
8. c
9. b
10. b
11. c
12. a
13. a
14. b
15. c
16. a
17. b
18. c
19. a
20. b
21. c
22. a
23. b
24. a
25. b

To the instructor: The above problems are related to the following objectives:

OBJECTIVE 1 : Questions 1,3,5, - - - all odd

OBJECTIVE 2 : Questions 2,4,6, - - - all even